

Remarks

*March 26 Interview Summary* - Applicants acknowledge with gratitude the telephonic interview of March 26, 2003 with Examiner, and attorneys Servilla and Beall. In that interview, claims 1-31, 51-53 were discussed. Proposed amendments to claims 1, 51 and 52 were offered by applicant. Examiner indicated that the claim amendments may put the claims in condition for allowance, but that the proposed amendments would require a new search. It was agreed that applicants would file a RCE such that the Examiner might properly perform the required search and consider the proposed amended claims. Applicants respectfully request a copy of Examiner's interview summary such that the file may be complete.

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding final office action is respectfully requested.

Claims 1-32 and 51-53 remain in this application. Claims 1, 51 and 52 have been amended. Support for the new independent claims 54 and 86 can be found in paragraphs 0004 and 0032 of the application. Dependent claims 55-85 mirror the language of dependent claims 2-32.

**§ 102 Rejections**

Applicants respectfully traverse the rejections in paragraph 9 of the Office Action mailed on February 24, 2003. Claim 1 and 51 have been amended to include the limitation "wherein the microspots remain adsorbed when drawn through an air-water interface." Claims 2-32 depend from claim 1. None of the references cited by the Examiner alone or in combination teach microspots that remain adsorbed to a substrate when drawn through an air-water interface.

Applicants' specification at paragraph 003 describes several methods for preparing arrays of membranes that involve fabricating grids or patterns on the surface of a substrate and that require the membrane patterns to be printed on surfaces immersed under water. These patterned membranes were not stably associated with the substrate because they desorbed when drawn through an air-water interface. In addition, printing arrays underwater limits the ability to produce arrays of biological membrane microspots because many devices for printing microspots are not adapted to print underwater. However, according the present invention arrays can be printed underwater and drawn through an air-water interface without

desorption, and further, arrays can be produced, used and stored in air under ambient conditions.

Applicants respectfully submit that the Bieri reference cited by the Examiner fails to teach or suggest an array of membrane microspots stably associated with the surface of the substrate, and more specifically membrane microspots that would not spontaneously desorb when drawn through an air-water interface. Furthermore, Bieri fails to teach arrays that are capable of being produced, stored or used in an environment exposed to air under ambient humidity. The Bieri article discusses performing assays using surface plasmon resonance (SPR) in a flowthrough assay format, meaning the membrane sample remains immersed in a liquid (see page 1107, column 2, second full paragraph of the Bieri article). The Experimental protocol section of the Bieri article makes clear that the membrane patterns (which are striped patterns, not microspots) were processed in cuvettes diluted in buffer solution (see page 1108, first column, third full paragraph). Bieri states that measurements were performed in a stirred cuvette, again making clear that the membrane patterns were only stable if they were kept in solution (see page 1108, first column, fourth full paragraph). The Bieri article fails to teach an array of membrane microspots that do not desorb from the substrate when drawn through an air-water interface because the substrates remain immersed in a solution during formation of the striped patterns and measurement. Accordingly, applicants respectfully submit that the Bieri article does not anticipate applicants' claims 1-32 and 51, and request withdrawal of the rejection.

Applicants also traverse the rejections in paragraph 12 of claims 1-3, 6-9, 11-14 and 52 under 35 U.S.C. § 102 over the Emili reference. With respect to claim 52, the Examiner gave no patentable weight to the limitation "an array that is capable of being produced, used or stored in an environment exposed to air under ambient humidity", citing MPEP Section 2114. Claim 52 has been amended to state that "wherein the surface of the array substrate is adapted such that the array can be produced, used, or stored in an environment exposed to air under ambient humidity." Applicants respectfully point out that MPEP Section 2173.05(g) states that "[a] functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or ingredients. There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)" (emphasis added). This section of the MPEP provides two

examples of functional limitations that were deemed acceptable by the CCPA. In the first case, a radical on a chemical compound that was defined as "incapable of forming a dye with said oxidizing developing agent" was acceptable. In another case, the limitation "adapted to be positioned" and other functional limitations were held to be acceptable limitations.

In the *In re Swinehart* case, cited and relied upon in MPEP section 2173.05(g), the court stated, "We take the characterization 'functional' . . . to indicate nothing more than the fact that an attempt is being made to define something. . . by what it does rather than by what it is (as evidenced by specific structure material, for example). In our view there is nothing wrong with the use of such a technique in drafting patent claims. Indeed we have even recognized in the past the practical necessity of for the used functional language." 439 F.2d 210, 212-213 (CCPA 1971). This passage and section 2173.05 (g) make clear that it is acceptable to define an invention by what it does to distinguish over the prior art. Federal Circuit cases have followed this approach. In the case *In re Stencel*, the court considered the patentability of claims directed to a tool driver which turns a collar and deforms the collar to tighten and lock it around a bolt. In holding the claims patentable, the court stated, "Stencel is not inhibited from claiming his driver, limited by the statement of its purpose, and further defined by the remaining clauses of the claims at issue, when there is no suggestion in the prior art of a driver having the claim structure and purpose. 828 F.2d 751, 755 (Fed. Cir. 1987).

In view of the MPEP section and cases discussed above, applicants respectfully submit that the language in claim 52 is proper and should be considered by the Examiner in determining the patentability of the claim. The Emili reference fails to teach arrays of biological membrane microspots wherein the microspots remain adsorbed when drawn through an air-water interface, or arrays in which the surface of the array substrate is adapted such that the array can be produced, used, or stored in an environment exposed to air under ambient humidity. Applicants request withdrawal of the rejection.

### **§ 112 Rejection of Claim 53**

In paragraph 10 of the Office Action, claim 53 was rejected under 35 U.S.C. § 112 first paragraph because the recitation of "the biological membrane microspots retain their ability to bind to a ligand when stored in air" has no support in the specification. Applicants traverse this rejection. Support for this is clearly found in paragraph 75 of the specification.

Paragraph 75 of the specification describes an example in which GPCR arrays were stored in air in a dessicator for two weeks, and these arrays retained their ligand binding affinity after storage in air for two weeks. This example clearly supports the limitation in claim 53. Withdrawal of the rejection is respectfully requested.

### **§ 103 Rejections**

In paragraph 13, of the Office Action, claims 1-9, 11-14, 20-21, 27-32 and 52-53 were rejected as being obvious over Bieri in view of Lang. Applicants traverse this rejection and maintain that the Examiner has failed to establish a prima facie case of obviousness. The arguments made with respect to Bieri and Lang in the previously submitted amendment are reiterated here. In short, Bieri and Lang both teach the necessity of providing membranes on substrates in aqueous media. Lang does not teach or suggest the formation an array of membrane microspots on a substrate. There is no teaching or suggestion in the references alone or in combination of microspots remain adsorbed when drawn through an air-water interface, or arrays in which the surface of the array substrate is adapted such that the array can be produced, used, or stored in an environment exposed to air under ambient humidity

In paragraph 14 of the Office Action, claims 1, 7-11, 15-19, 2, 32, and 51-52 were rejected over Bieri in view of Patton. The deficiencies of the combined teachings of the Bieri in view of Patton were discussed at length in the previously submitted Amendment, and those arguments are reiterated here. Patton fails to remedy the deficiency in Bieri, namely, microspots remain adsorbed when drawn through an air-water interface, or arrays in which the surface of the array substrate is adapted such that the array can be produced, used, or stored in an environment exposed to air under ambient humidity. Applicants request withdrawal of the rejection.

In paragraph 16, claims 1, 8-9, 20-25 and 52 were rejected as being obvious over Bieri in view of Plant. The deficiencies of the combined teachings of the Bieri in view of Patton were discussed at length in the previously submitted Amendment, and those arguments are reiterated here. Plant fails to remedy the deficiencies of Bieri, and the combined teachings of the reference fail to suggest microspots remain adsorbed when drawn through an air-water interface, or arrays in which the surface of the array substrate is adapted such that the array can be produced, used, or stored in an environment exposed to air under ambient humidity. Applicants request withdrawal of the rejection.

### Conclusion

In view of the foregoing remarks, the application is believed to be in condition for allowance, and early notice to this effect is earnestly solicited. If allowance of this application may be expedited by resolution of simple issues through a telephone conference, the Examiner is welcome to call Tom Beall at Corning, Incorporated at 607-974-3921.

Applicant believes that a three month extension of time is necessary to make this Amendment timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned attorney, Deposit Account 033325.


Respectfully submitted,



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Date: August 19, 2003

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